Cross-Validation

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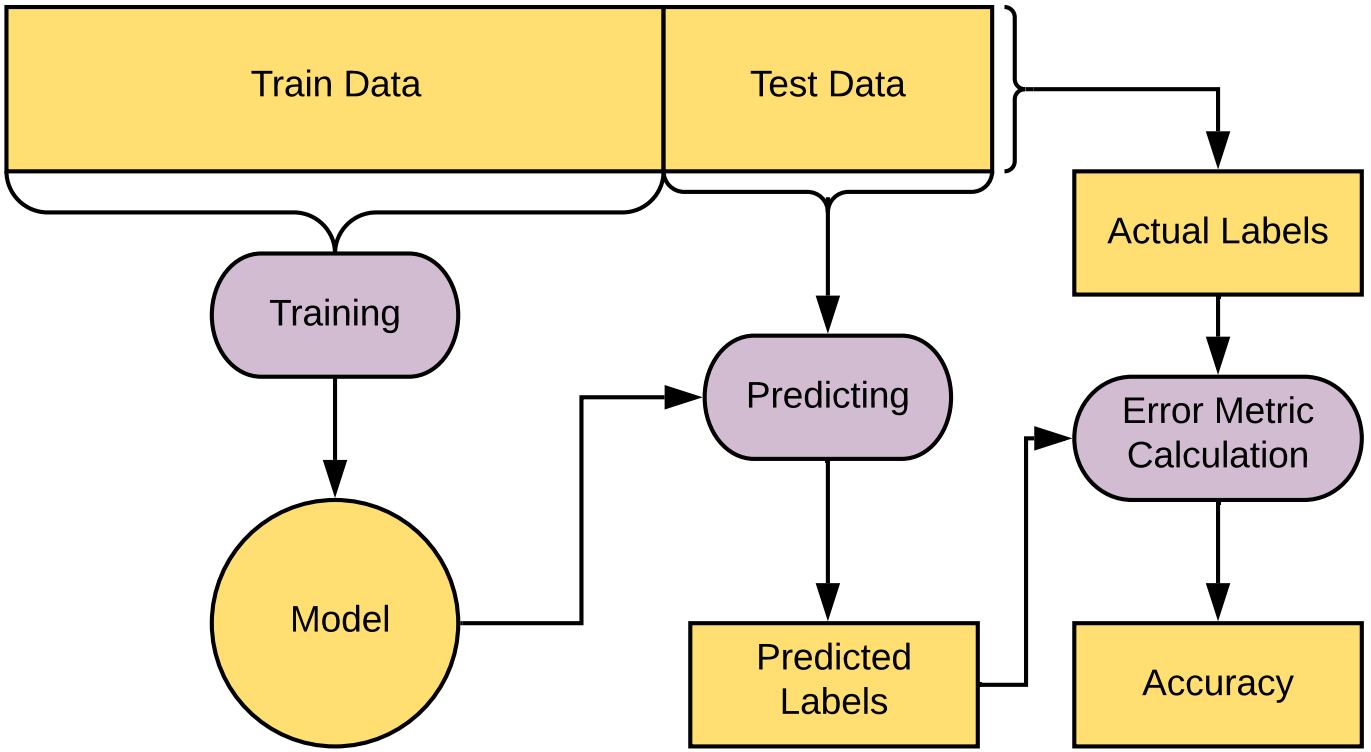
IIT Gandhinagar

Our General Training Flow



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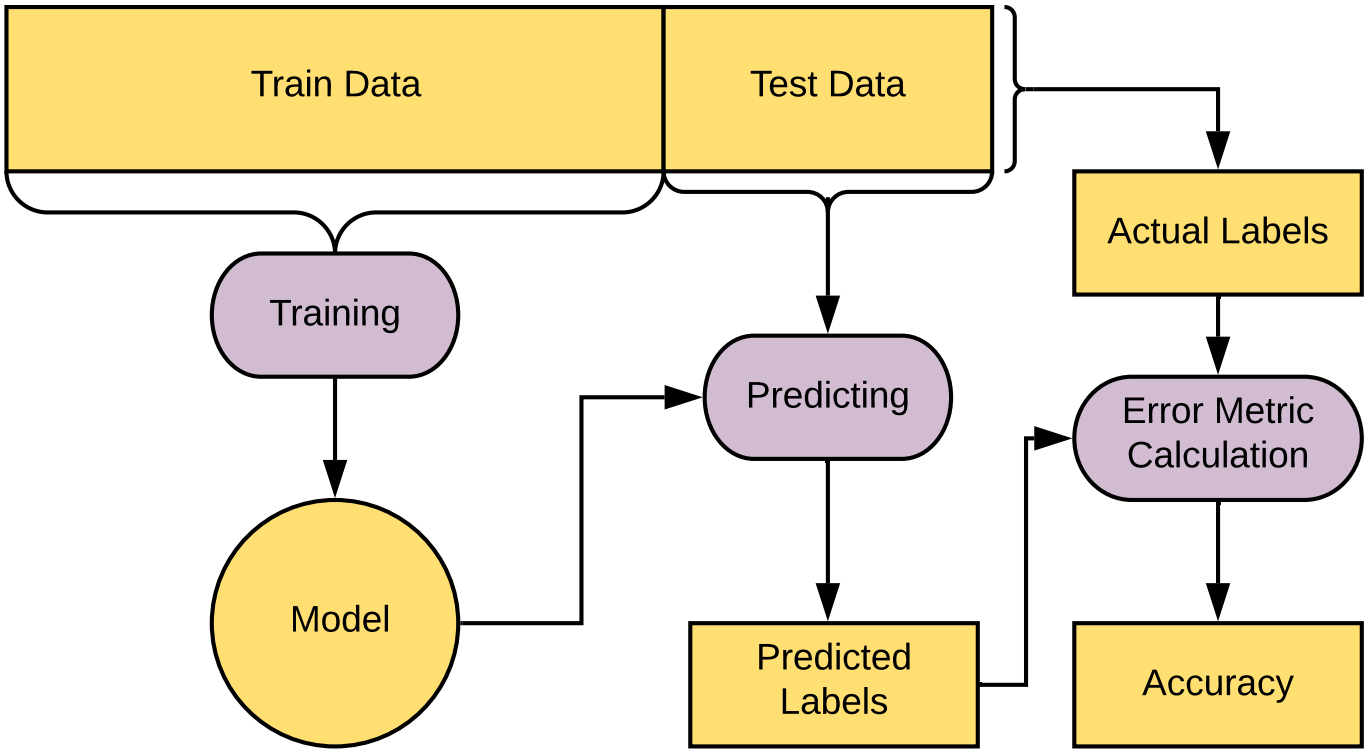

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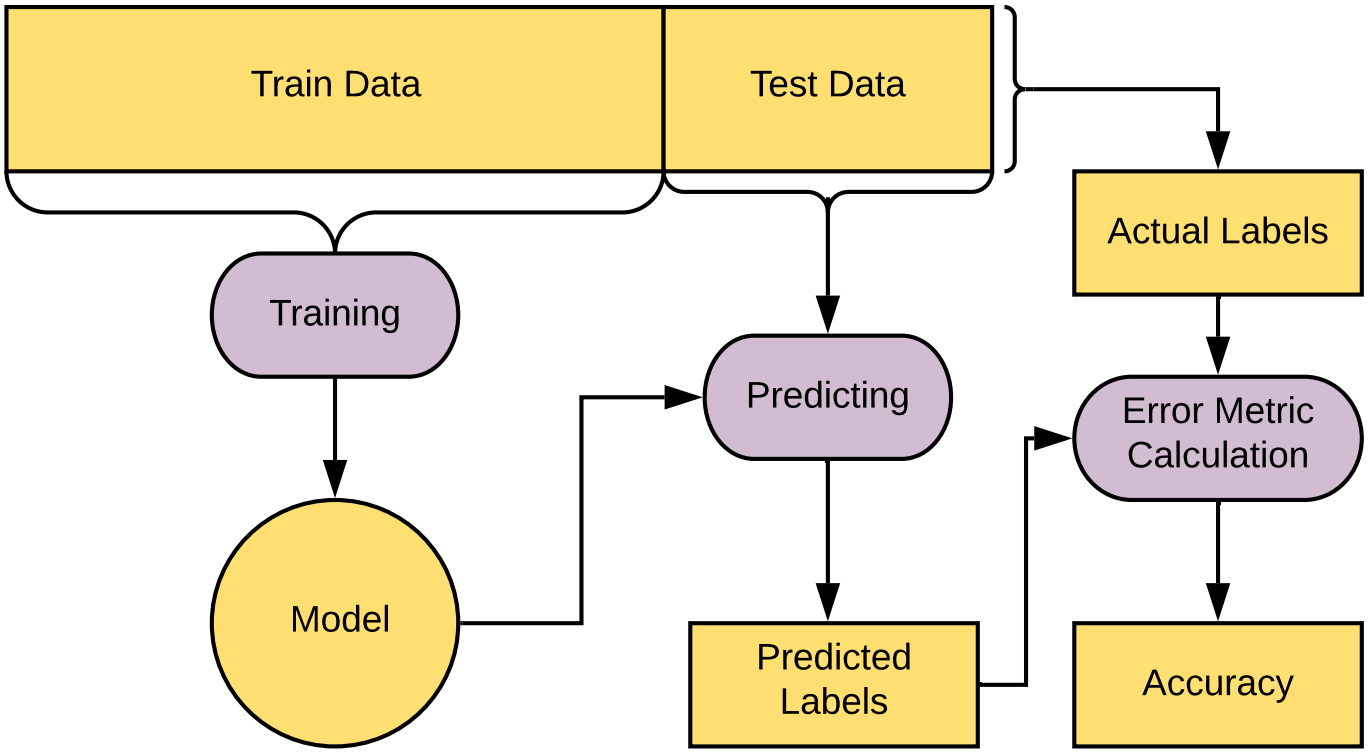

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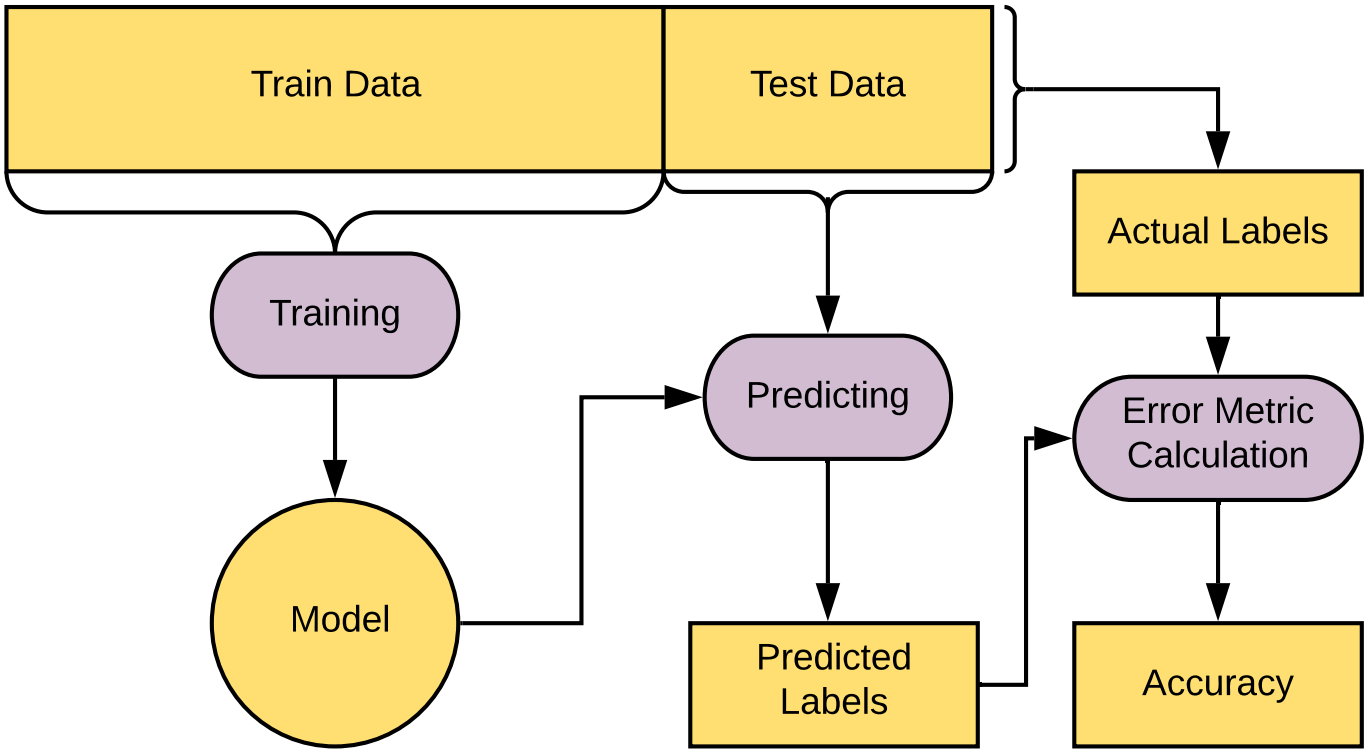

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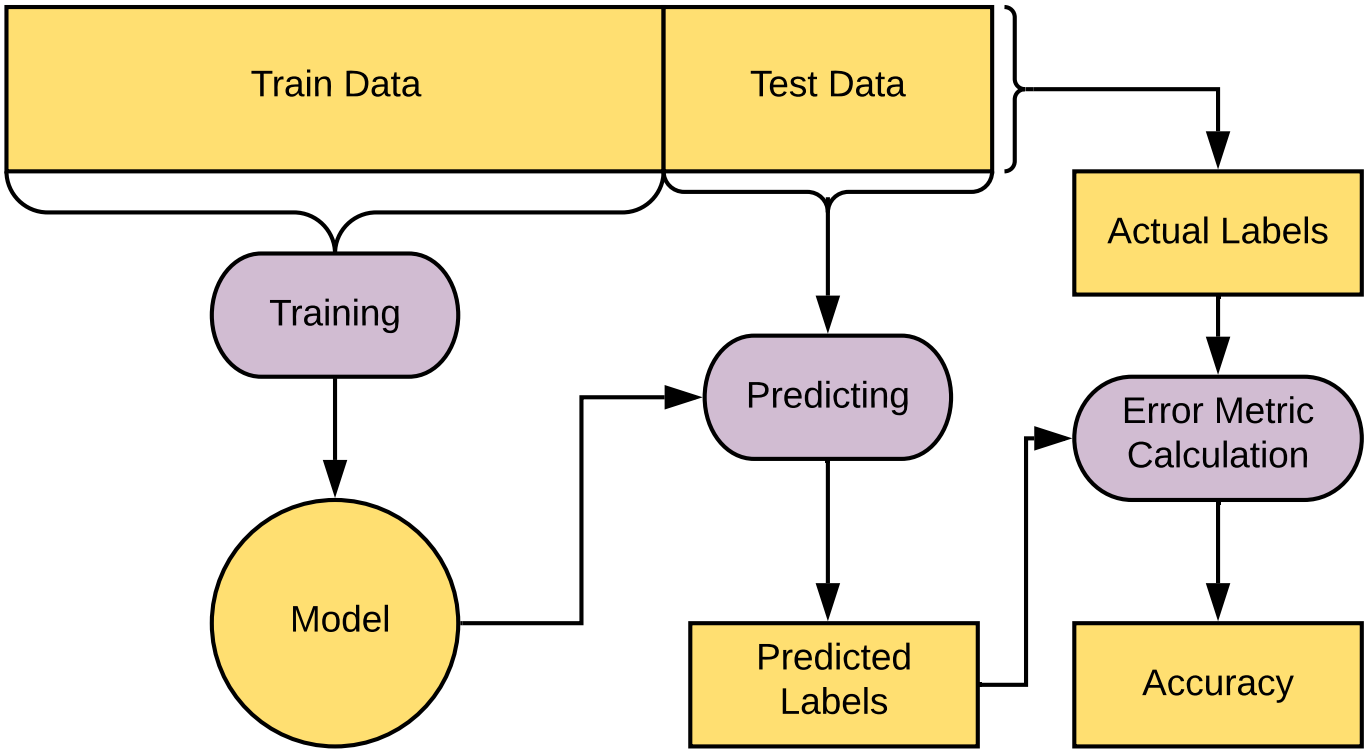

- Does not use the full dataset for training and does not test on the full dataset
- No way to optimize hyperparameters

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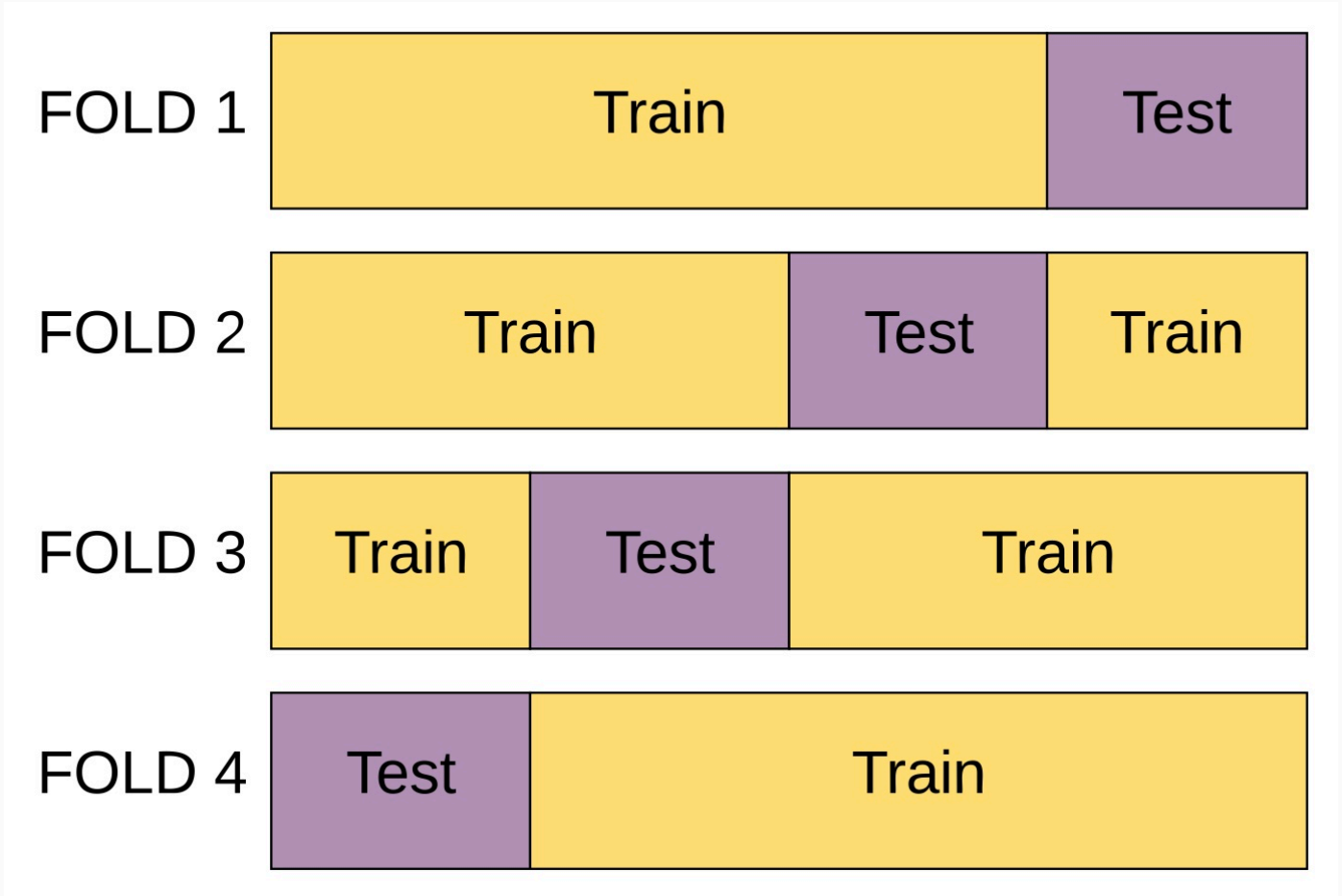
- Challenge?
- May not use every data point for training or testing
- May be computationally expensive

K-Fold cross-validation: Utilize full dataset for testing



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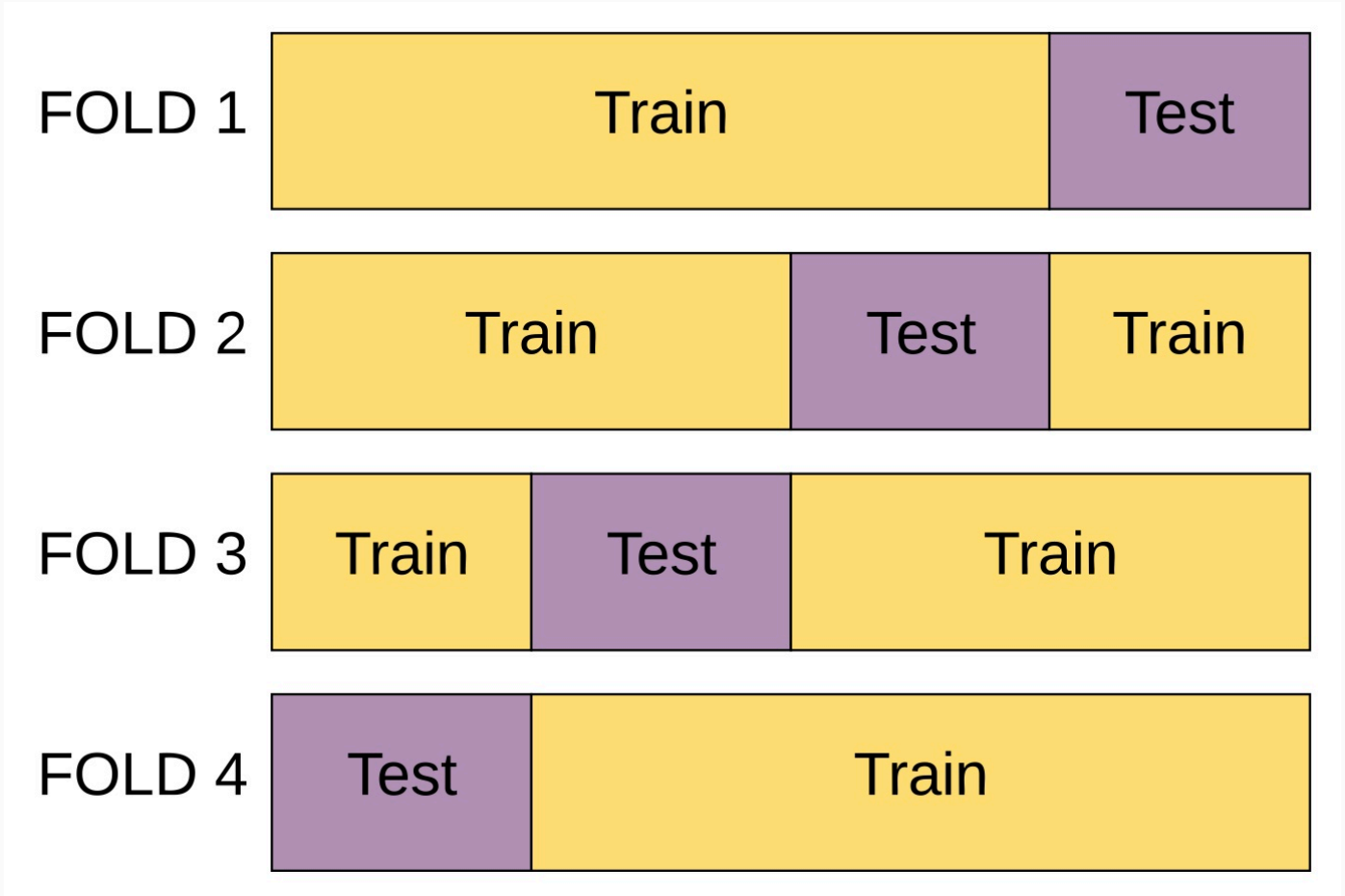
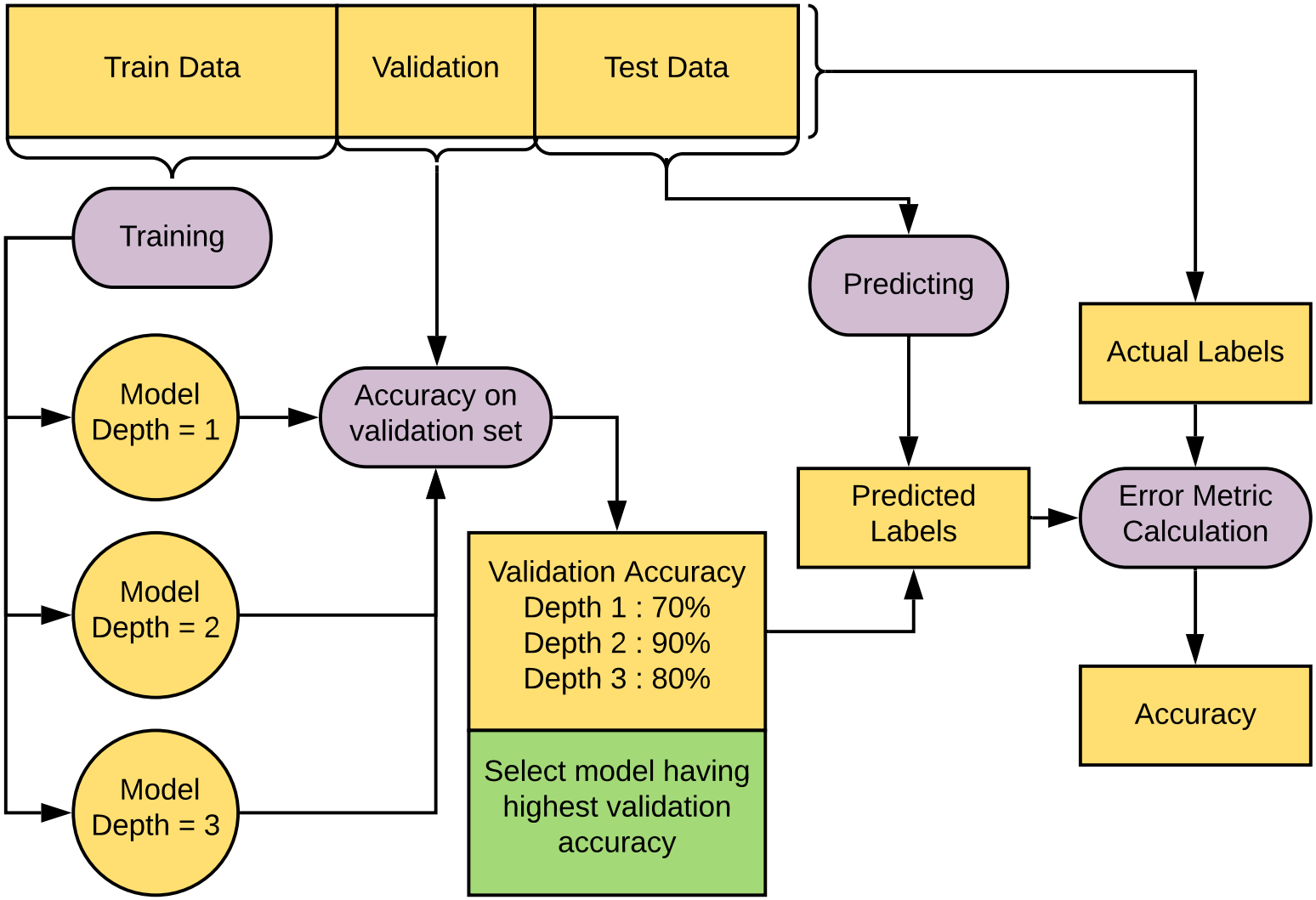


Each data point is used for testing exactly once.

Optimizing Hyperparameters via the Validation Set

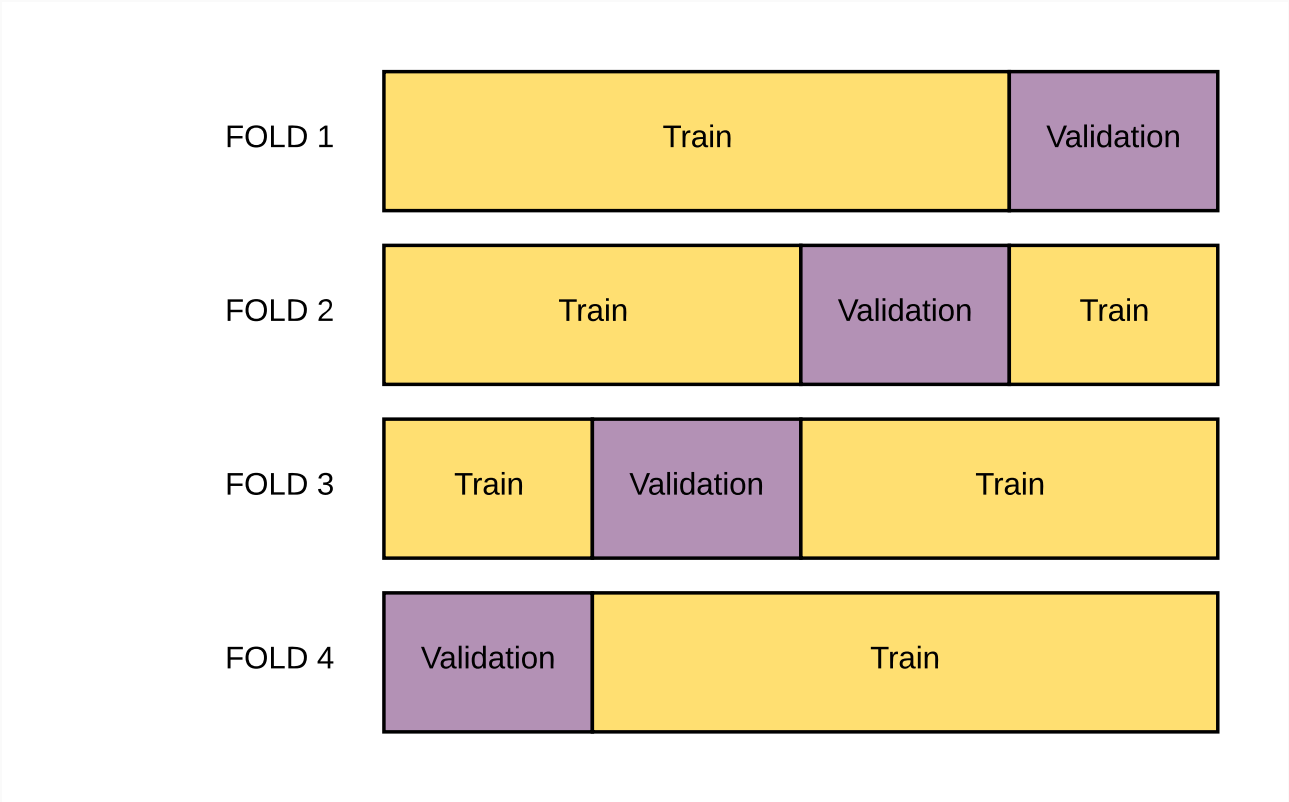


Nested Cross Validation

Divide your training set into k equal parts.

Cyclically use 1 part as "validation set" and the rest for training.

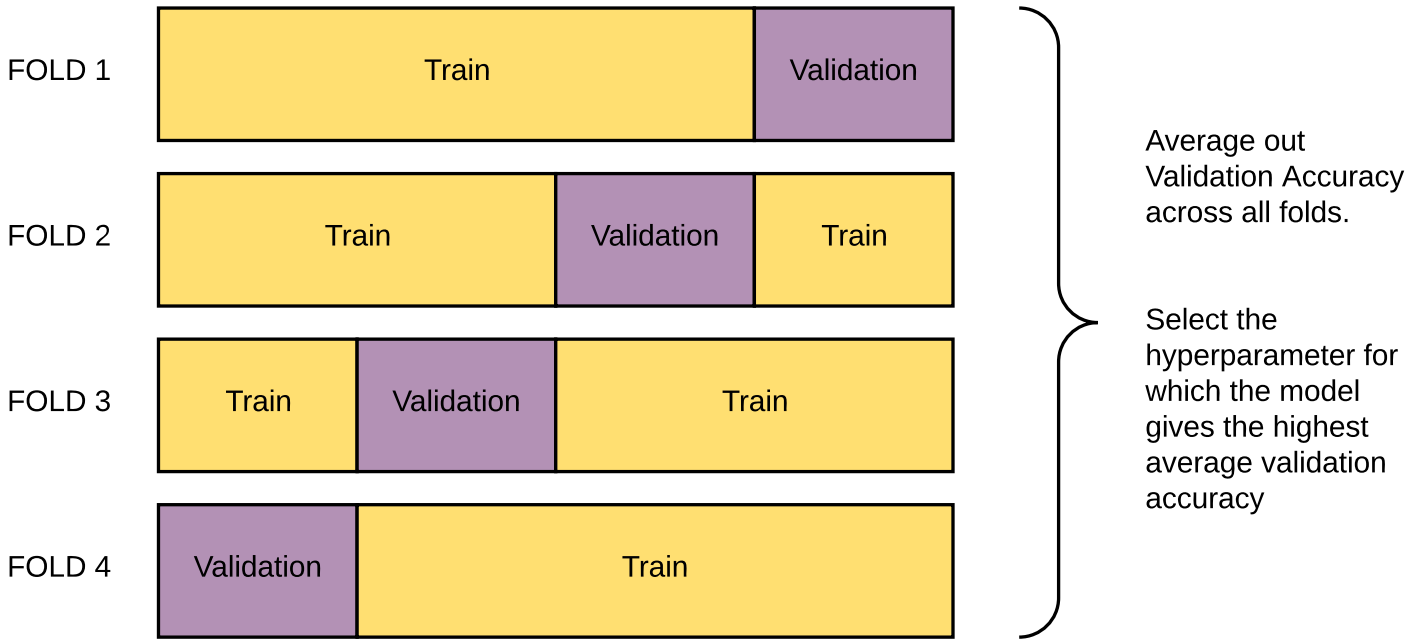
Here $k = 4$



Nested Cross Validation

Average out the validation accuracy across all the folds

Use the model with highest validation accuracy



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- How can we reduce variance?